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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/750,408

12/31/2003

Sumeet Sandhu

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02/22/2007

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EXAMINER

AHN, SAM K

ART UNIT

PAPER NUMBER

2611

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

02/22/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/750,408

Applicant(s)

SANDHU, SUMEET

Examiner

Sam K. Ahn

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-51 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 22-26, 35-37 and 40-51 is/are rejected.
- 7) ☒ Claim(s) 5-21, 27-34, 38 and 39 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 081806, 120905
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Priority

1. Applicant appears to claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, or 365(c). Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 119 (e) as follows:

The later-filed application must be an application for a patent for an invention which is also disclosed in the prior application (the parent or original nonprovisional application or provisional application). The disclosure of the invention in the parent application and in the later-filed application must be sufficient to comply with the requirements of the first paragraph of 35 U.S.C. 112. See *Transco Products, Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 32 USPQ2d 1077 (Fed. Cir. 1994).

The disclosure of the prior-filed application, Application No. 60/TBD, as described on page 1 of the specification, fails to provide adequate support or enablement in the manner provided by the first paragraph of 35 U.S.C. 112 for one or more claims of this application. The application does not provide the provisional application number, hence, does not support the provisional application its depending on for priority date. And furthermore, note that on page 1 of the specification claims the inventor as Shao, et al., while the inventor of the instant application is by Sumeet Sandhu.

Claim Objections

Art Unit: 2611

2. Claims 1-51 are objected to because of the following informalities:

In claim 1, in various lines "antenna(e)" should be "antennas", line 3, delete "and", line 4, delete "elements", and line 8, "the antenna(e)" should be "said at least two or more antennas".

In claim 3, define "LDPC" and "BCH".

In claim 22, define "QAM".

In claim 24, in various lines "antenna(e)" should be "antennas".

In claim 25, line 2, "a transmitter" should be "the transmitter".

In claim 35, define "QAM".

In claim 40, in various lines "antenna(e)" should be "antennas".

In claim 41, line 2, "a transmitter" should be "the transmitter".

Claims 2,4-21,23,26-34,36-39 and 42-51 directly or indirectly depend on claim 1,24 or 40. Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claim 23 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Data structures not claimed as embodied in computer-readable media are descriptive material per se and are not statutory because they are not capable of causing functional change in the computer. Such claimed data structures do not

define any structural and functional interrelationships between the data structure and other claimed aspects of the invention which permit the data structure's functionality to be realized. In contrast, a claimed computer-readable medium encoded with a data structure defines structural and functional interrelationships between the data structure and the computer software and hardware components which permit the data structure's functionality to be realized, and is thus statutory.

Similarly, computer programs claimed as computer listings per se, i.e., the descriptions or expressions of the programs, are not physical "things." They are neither computer components nor statutory processes, as they are not "acts" being performed. Such claimed computer programs do not define any structural and functional interrelationships between the computer program and other claimed elements of a computer which permit the computer programs' functionality to be realized. In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory.

In this case, the claim does not recite a computer readable medium stored in a computer to perform the method, but a storage medium comprising content, hence the claim is non-statutory.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor or carrying out his invention.

4. Claims 40-51 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 40, line 2, recites "two or more dipole antenna(e)...". The specification explains implementation of two or more antennas in the system, however, does not explain how the two or more dipole antennas are incorporated into the system to perform properly functions, hence, the claim contains subject matter which was not described in the specification in such a way to reasonably convey to one skilled in the art. Claims 41-51 directly or indirectly depend on claim 40.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

Art Unit: 2611

only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-4,22,24-26,35-37 and 40-42 are rejected under 35 U.S.C. 102(e) as being anticipated by Walton et al. US 2004/0081073 A1 (Walton).

Regarding claim 1, Walton teaches a method comprising: receiving content from a host device for transmission via two or more tones in a multicarrier communication channel from two or more antenna(e) (receiving data from a host device of data source 112 in Fig.1 for transmission via multiple tones or subbands in Fig.5 in OFDM communication channel from multiple antennas 128a – 128d in Fig.1); and multiplexing elements of the received content among at least a subset of the two or more antenna(e) (multiplexing 416 in Fig.4 of the received data arrived from 112 in Fig.1 wherein the multiplexing step is within 120 in Fig.1 further illustrated as Fig.4 among at least subset of two antennas, the multiplexed data output from 120, provided to at least two antennas 128a and 128d via 122 in Fig.1); and interleaving the multiplexed elements across multiple tones of the multicarrier wireless communication channel on at least a subset of the two or more antenna(e) to generate a signal for transmission from the antenna(e) (interleaving 424a – 424d the multiplexed elements output from 416 in Fig.4, across multiple tones of subbands in Fig.5 of OFDM channels on at least a subset of two antennas Antenna 1 – Antenna 4).

Regarding claim 2, Walton further teaches wherein the received content is coded bits (wherein the data from the data source 112 in Fig.1 is coded by 216 in

Fig.2, hence the data received by the multiplexing step are coded bits, 218 in Fig.4 receiving Code Bits).

Regarding claim 3, Walton further teaches wherein the bits are coded using convolutional code (1/2 binary convolutional encoder, note paragraph 0035).

Regarding claim 4, Walton further teaches wherein the interleaving element (424a – 424d in Fig.4) comprising: tone interleaving, wherein adjacent or nearly adjacent coded bits on each of the antennae are mapped to nonadjacent subcarriers (note paragraph 0060 and Table 3 wherein the interleaved data are reordered among different subbands and see Fig.5 wherein the data for each of the antennas are assigned in nonadjacent manner of having gaps in each of the subband set).

Regarding claim 22, Walton further teaches mapping the interleaved coded bits to QAM symbols (note paragraph 0036 mapping the interleaved data from 220 into different QAM symbols of 16 QAM, 64 QAM or 256 QAM, see Table 1).

Regarding claim 24, the claim is rejected as applied to claim 1 with similar scope. Walton further teaches a diversity agent (120 in Fig.2) coupled to a transmitter (122 coupled to the plurality of antennas in Fig.2).

Regarding claim 25, Walton further teaches the transmitter (122 coupled to the plurality of antennas in Fig.2) coupled to the diversity agent (120), to convert the multiplexed and interleaved content to a time domain representation (IFFT, 812 in Fig.8, wherein IFFT is well-known to one skilled in the art of converting frequency

domain to time domain) before selectively directing to the antennas (128a – 128d in Fig.2).

Regarding claim 26, the claim is rejected as applied to claim 4 with similar scope.

Regarding claim 35, the claim is rejected as applied to claim 22 with similar scope.

Regarding claim 36, Walton further teaches a cyclic prefix element (814), to dynamically introduce a cyclic shift into the QAM symbols from one antenna to another (note pr. 0105, and wherein the OFDM symbols are modulated through QAM, as explained in Table 1).

Regarding claim 37, Walton further teaches wherein the cyclic shift from antenna to antenna may or may not be greater than 1 (note paragraph 0105 shift being adjusted by a control signal).

Regarding claim 40, the claim is rejected as applied to claim 24 with similar scope. Walton further teaches the limitation of communicating with a remote device (150x, 150y in Fig.1).

Regarding claim 41, the claim is rejected as applied to claim 25 with similar scope.

Regarding claim 42, the claim is rejected as applied to claim 26 with similar scope.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Walton et al. US 2004/0081073 A1 (Walton '073) in view of Walton et al. US 2004/0082356 A1 (Walton '356).

Regarding claim 23, Walton '073 teaches all method steps of claim 1, as applied to claim 1. And although Walton teaches the method steps of claim 1, does not explicitly teach a storage medium executing the method steps.

Walton teaches, in the same field of endeavor, of a system operating transmit diversity by in a wireless LAN, wherein the wireless LAN also communicates wirelessly with computers (note paragraph 0006). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to incorporate the teaching of Walton '356 of implementing the steps of Walton '073 in the computer, as taught by Walton '356, for the purpose of implementing the steps for wireless LAN environment, note paragraph 0006.

Allowable Subject Matter

7. Claims 5-21,27-34,38 and 39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of

Art Unit: 2611

the limitations of the base claim and any intervening claims, and overcome the claim objections.

8. The following is a statement of reasons for the indication of allowable subject matter: present application discloses a method and an apparatus of performing transmit diversity in a transmitter comprising the steps of multiplexing and interleaving and cyclic prefix generating. Prior art teaches all the subject matter claimed. However, prior art does not teach the further combined limitation with its depending claim of separating adjacent bits in the interleaver by a function of a bandwidth of the channel or proportional to a length of channel impulse response in time, or a qam interleaving onto qam constellation to reduce long runs of low reliability bits.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sam Ahn whose telephone number is (571) 272-3044. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Khanh Cong Tran

02/20/2007

Sam K. Ahn
Patent Examiner

2/9/07

KHANH TRAN
Primary Examiner